Low cost coplanar UHF RFID tag antenna using U-shaped feeder for metallic applications

ABSTRACT

In this design, low cost coplanar slim tag antenna has been introduced for UHF band (860-960 MHz) which is designed for metallic objects. The tag antenna was proposed with proximity coupled feeding; a transmission line fed by a U-shaped inductively coupled feed and two symmetrical coplanar ground layers. Furthermore, the U-shaped feeder's configuration consists of two opposing symmetrical U-shaped structures to feed the tag antenna. The size of the antenna was 72×42×1.6 mm3 at 915 MHz. According to the results, the gain for the tag antenna reached up to 2.3 dBi at 915 MHz. In addition, the bandwidth of the antenna is 15 MHz (907-922) MHz (the power reflection coefficient was lower than -3 dB), while the reading range reached up to 5.3 meters. Besides, the results obtained from the implementation showed very good impedance matching due to the flexibility generated by the U-shaped inductive feeder.

Keyword: Low cost; Coplanar; Tag antenna; Metallic objects; U-shaped feeder